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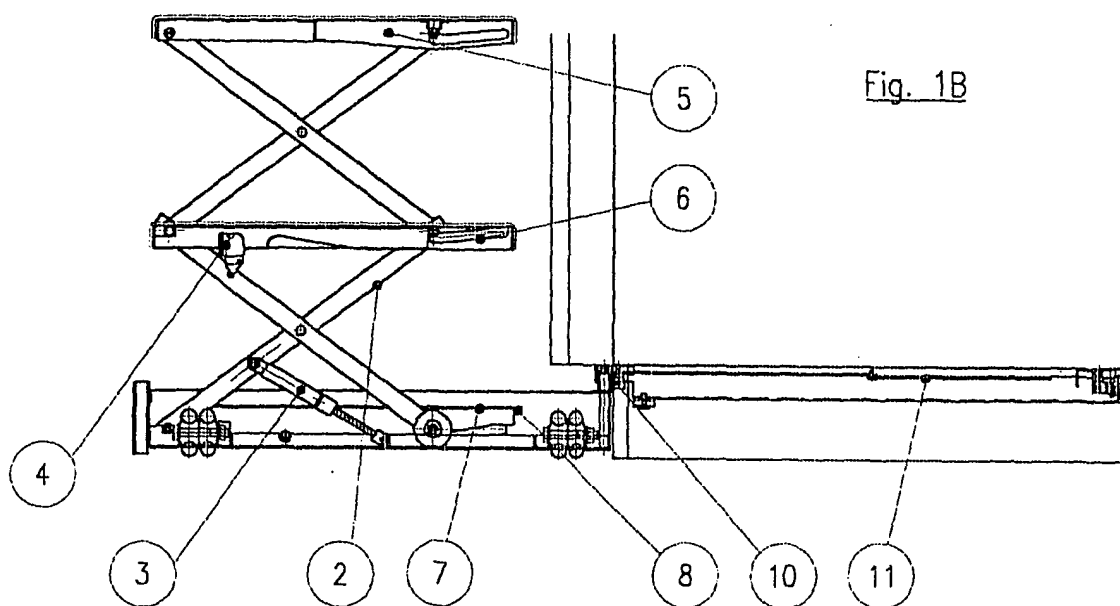
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### (54) Retractable folding step stool

(57) A retractable folding step stool is described, which is housed in the closed position either underneath a piece of furniture in the skirting board's dimensions in the domestic version or closed inside a briefcase in the

carrying version. The housing's extraction and the step stool's deployment in the operative position occur through a very simple setting off of the corresponding pantograph mechanism (2) moved by gas springs (3).



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## Description

**[0001]** The present invention is about an innovative retractable folding step stool for domestic and/or professional use, designed with the most advanced computerized technology and following criteria of ergonomics and of practicality, which is especially suitable as kitchen and wardrobe furnishing, or else as installers' equipment in the briefcase version.

**[0002]** Modern furnishing solutions use furniture which takes advantage of the entire wall's height for wardrobe and kitchen rooms.

**[0003]** Therefore it becomes difficult to reach these pieces of furniture's highest shelves for the most part in the kitchen wall units, which are those mostly employed.

**[0004]** Every family makes use of two or three steps stools stored on the balcony or in the closet to be drawn out when needed.

**[0005]** It is exactly the inconvenience of having to go to draw out the step stool, by opening doors (which represents an action that jeopardizes the air-conditioning unit's operation), leads many people to use a kitchen chair in order to reach the kitchen wall units' highest shelves which are otherwise unreachable.

**[0006]** This misuse of chairs is the cause of several domestic accidents every year. In addition to the accident risk, the use of chairs that have a considerable difference in height is harmful for the user's spine and sometimes is also prevented to elderly persons or to people affected by articulation illnesses.

**[0007]** The applicant has developed, with the object of improving the kitchen room's safety and of facilitating the housekeepers' daily activities, a two steps stool which, when closed, retracts itself underneath the furniture inside the skirting board dimensions.

**[0008]** The step stool is set off with a foot, therefore it can be used even with both hands busy and in a very brief time. The convenience offered by the briefcase version to those persons who have to work with both hands must be also emphasized.

**[0009]** The retracting folding step stool's features according to the present invention are set forth in claim 1, and further useful characteristics are indicated in the dependant claims.

**[0010]** The two versions of the retractable folding step stool according to the invention are here described with reference to the various drawings' annexed sheets wherein:

Figure 1A is a side view of the closed step stool for domestic use;

Figure 1B is a side view of the step stool pulled out of the furniture and opened in the operative position; Figure 1C is a front view of the step stool as shown in Figure 1A;

Figure 1D is a plan view of the step stool pulled out of the furniture;

Figure 2A is a side view of the step stool in the

closed briefcase version;

Figure 2B is a front view of the step stool of Figure 2A; and

Figure 3 is a perspective view of the opened step stool, in the retractable version.

**[0011]** Making now reference to the various annexed drawings' views, the device is essentially made of two units; and more precisely of:

1. The box which is the functional and mobile part of the device, consisting of: a main plate framework 1 which houses a pantograph lifting mechanism 2 advantageously built with round and square steel tubes moved by gas springs 3 and equipped with locking spring latches 4 in the closed position, where the upper step 5 and the lower step 6 are preferably made of sheet steel covered by anti-slip plastic material; a steel safety locking system 7 with a return spring 8; a sliding system with retractable damped casters 9; lateral guide wheels 10; a carrying handle and safety lock, only for the briefcase version, not shown in the drawing. The briefcase version is however equipped with a lid 16 shown in Figure 2B.

2. The counter-box (not present in the briefcase version) which is the fixed and housing part of the device in the rest position, consists of: a small casing 11, to be fixed underneath the furniture; a sliding or pantograph mechanism 12 moved by an elastic system 13 and equipped with locking spring latches 14 in the closed position; and an under-furniture aluminium extruded lateral slide guide 15.

**[0012]** The assembly of the device in its domestic version is carried out as it follows: the reduced dimensions allow to install the retractable folding step stool to a standard module of 60 cm with a minimum skirting board's height of 10 cm, fixed underneath to the piece of furniture (through wood self-tapping screws) or, in the case of application to an already placed furniture, it is fixed inside the same piece of furniture (through metric pitch screws).

**[0013]** The lateral sliding requires the assembly of an aluminium guide 15 underneath the piece of furniture just ahead of the skirting board. The guide can make curves up to 90° for angular applications. For pieces of furniture which have greater skirting board's heights different box's heights are provided, furthermore no parallelism between the furniture and the floor is required, not even the levelness of the floor itself, because the device adjusts itself to the surface where it works on. The retractable folding step stool has being designed in order to hold a maximum load of 200 kg, for this reason it offers the highest operation safety in the most demanding conditions as well.

**[0014]** The operations to carry out in order to pull out the step stool in the operative position are obvious and

consist of:

**[0015]** In the case of the fixed version, a small push with the foot on the skirting board's stretch of the piece of furniture which hides the device sets off the spring latches 14 which, by releasing the sliding or pantograph mechanism 12, pulls out completely the (closed) step stool from the furniture's dimensions. The movement is light and slow in order to avoid hitting the user's legs. The step stool can be moved sideways along the piece of furniture in order to reach the desired position. Once it reaches the extracted position, the whole device rests on the plastic retractable casters 9, thus making it suitable for the use on any surfaces with the exception of rugs and carpets, while it runs along the guide 15 installed underneath the piece of furniture in the hidden position.

**[0016]** A slight pressure on the lower step 6 of the (closed) step stool sets off the lifting mechanism 2 which deploys, with a gentle movement, the step stool up to the locking position; this is also the only operation, after having released the safety lock, to carry out in order to open the step stool in its briefcase version.

**[0017]** The user can thus climb the step stool and as soon as part of his/her weight is transferred to the step stool, the stool will rest on the floor so as to guarantee its stability because the casters 9 retract themselves inside the box's framework.

**[0018]** When the user has finished to use the step stool, it is enough to unlock the cutoff lever 7 (with a foot) in order to close the device and subsequently to push on the middle or lower step 6 (again with the foot) until the step stool is locked in the closed position. Instead at this point, in the briefcase version, the safety lock is set off and the briefcase is ready to be carried away.

**[0019]** In the fixed version the only thing left to do is that of putting the device back inside its housing underneath the piece of furniture, by setting off the spring latches 14 in the locking position. Clearly the device is not limited to two steps, but it could have, using the same assembling principles, more than two steps or even only one step thus operating as a retractable stool.

**[0020]** The practical use and the operative safety of the retractable folding step stool according to the invention is obvious, but it must be emphasized that several structural modifications could be made, without as well falling out of the scope of protection, as also indicated in the appended claims.

pantograph lifting mechanism is moved by gas springs and is equipped with locking spring latches in the closed position.

- 5 3. The step stool according to claim 1, wherein the at least one step is covered with anti-slip material.
4. The step stool according to claim 1 in the fixed version, further comprising a counter-box for housing the device in the rest position underneath a piece of furniture or another closet, consisting of a small framework and a pantograph or sliding extraction mechanism.
- 10 5. The step stool according to claim 4, wherein the pantograph or sliding extraction mechanism is moved by an elastic system and is equipped with locking spring latches in the closed position.
- 20 6. The step stool according to claim 4, further comprising a lateral slide guide underneath an array of pieces of furniture.
- 25 7. The step stool according to claim 1 in the briefcase version, comprising a box's cover equipped with a carrying handle and safety lock.
8. The step stool according to any of the previous claims, wherein the weight of the user who climbs the at least one step causes the casters to retract inside the box and the step stool's locking to the floor.
- 30 9. The step stool according to one or more of the previous claims, wherein the operations of extraction and/or deploying as well as releasing of the locking system for the step stool's closing are carried out by the user's foot through simple pull and/or push manoeuvres.
- 35 10. The step stool as it is basically described earlier and as it is shown in the illustrative drawings' annexed sheets.
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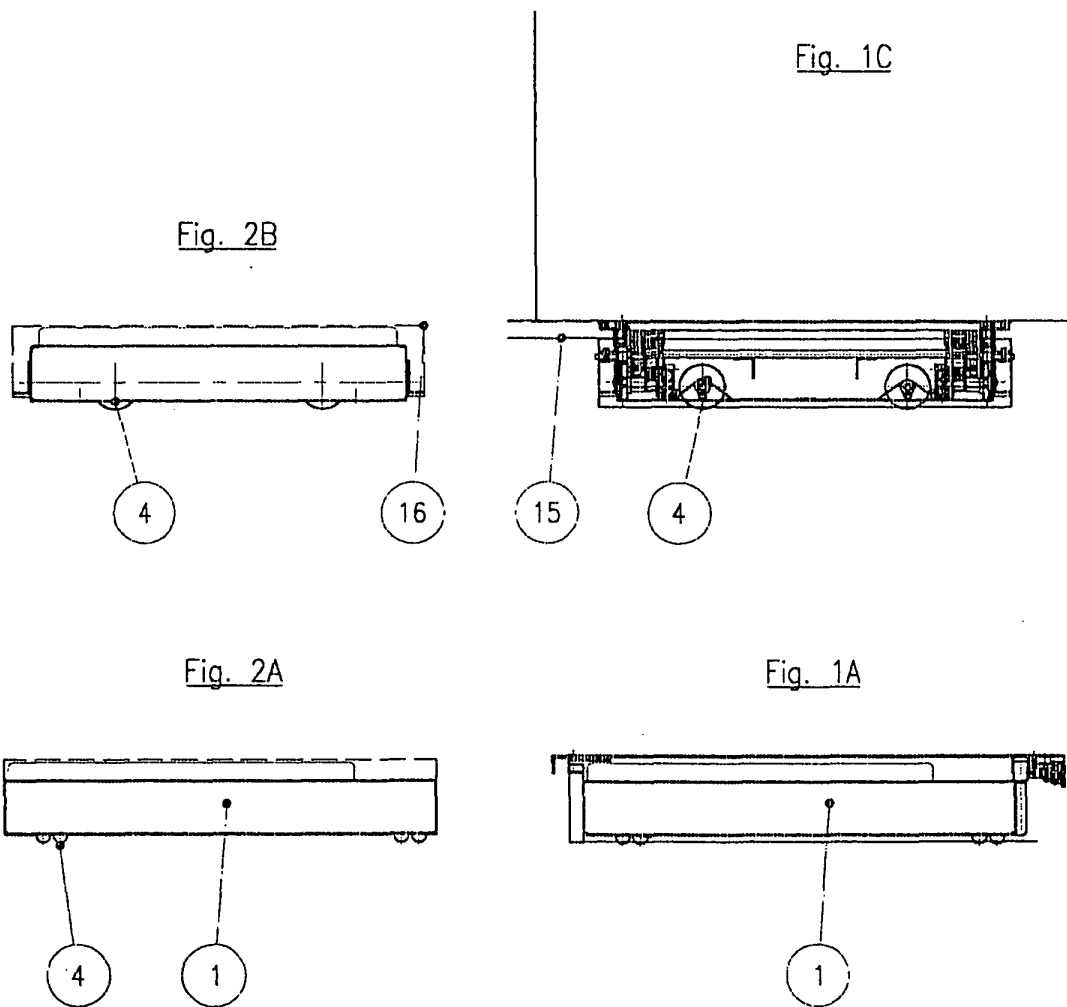
## Claims

1. A retractable folding step stool, made of a box comprising a main framework which houses a pantograph lifting mechanism, at least a step, a locking system, a sliding system with retractable casters and lateral guide wheels.

2. The step stool according to claim 1, wherein the

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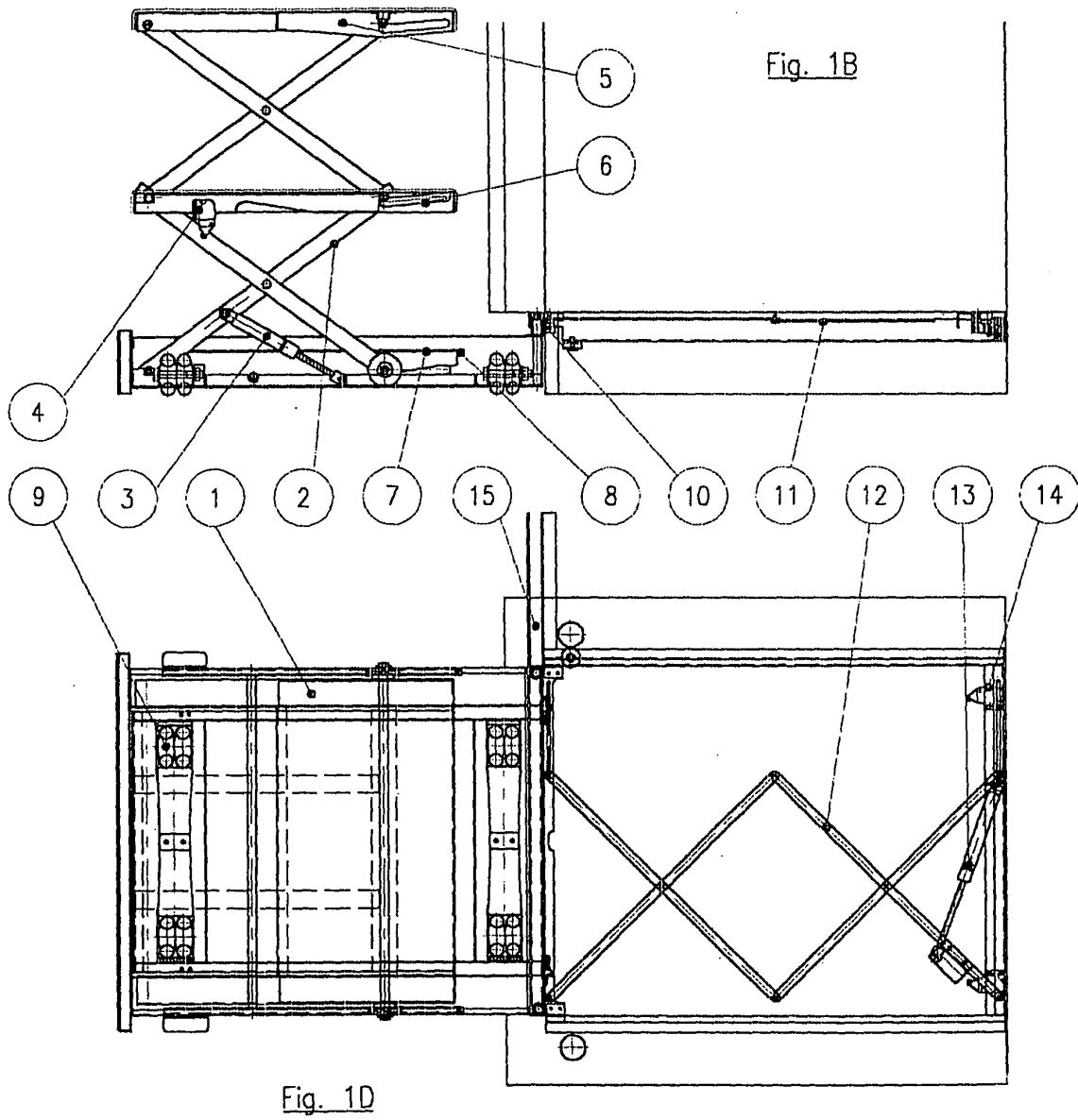


Fig. 3

